

- ◇Structure Silicon monolithic integrated circuit
- ◇Classification 8bit12chD/A converter
- ◇Product BH2221FV
- ◇Features •3-wire 12bit serial interface
 •POWER ON RESET circuit

◇Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Power Supply voltage	VCC	-0.3~7.0	V
Terminal voltage	VIN	-0.3~VCC	V
Storage temperature range	TSTG	-55~125	°C
Permissible loss	PD	650	mW

* This value decreases 6.5mW/°C above 25°C.

* When installed on the standard board (Size : 70x70 mm, t =1.6 mm).

◇Operating conditions (Ta=25°C)

Parameter	Symbol	Limits			Unit
		MIN.	TYP.	MAX.	
VCC power source voltage	VCC	2.7	—	5.5	V
VDD power source voltage	VDD	2.7	—	VCC	V
Terminal input voltage range	VIN	0	—	VCC	V
Analog output current	IO	-1.0	—	1.0	mA
Action temperature range	TOPR	-20	—	85	°C
Serial clock frequency	FSCLK	—	1.0	10.0	MHz
Limit load capacity	CL	—	—	0.1	μF

* This product is no antiradiation design.

◇Electric characteristics (VCC=3.0V, RL=OPEN, CL=0pF, Ta=25°C; unless otherwise specified.)

Parameter	Symbol	Limits			Unit	Condition
		MIN.	TYP.	MAX.		
VCC system	ICC	—	0.6	1.5	mA	CLK=1MHz, 80H setting
VDD system	IDD	—	1.0	2.0	mA	80H setting
L input voltage	VIL	GND	—	0.2VCC	V	
H input voltage	VIH	0.8VCC	—	VCC	V	
Output zero scale voltage	ZS1	GND	—	0.1	V	00H setting, IOH=0.0mA
Output full scale voltage	FS1	VCC-0.1	—	VCC	V	FFH setting, IOL=0.0mA
Differential non linearity error	DNL	-1.0	—	1.0	LSB	Input code 02H~FDH
Integral non linearity error	INL	-1.5	—	1.5	LSB	Input code 02H~FDH
VCC power source voltage rise time	trVCC	100	—	—	μS	VCC=0→2.7V
Power on Reset release voltage	VPOR	—	1.9	—	V	
Output setting time	tOUT	—	—	100	μS	

Status of this document

The Japanese version of this document is the formal specification.

A customer may use this translation version only for a reference to help reading the formal version.

If there are any differences in translation version of this document, formal version takes priority.

Application example

The application circuit is recommended for use. Make sure to confirm the adequacy of the characteristics.

When using the circuit with changes to the external circuit constants, make sure to leave an adequate margin for external components including static and transitional characteristics as well as dispersion of the IC.

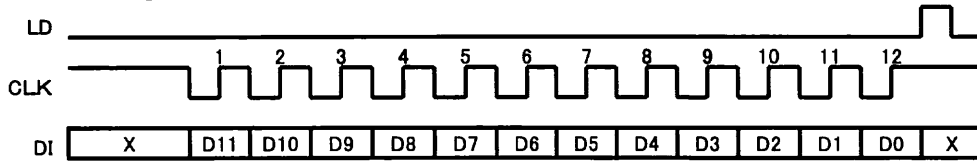
Note that ROHM cannot provide adequate confirmation of patents.

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◇Command sending



•Data setting

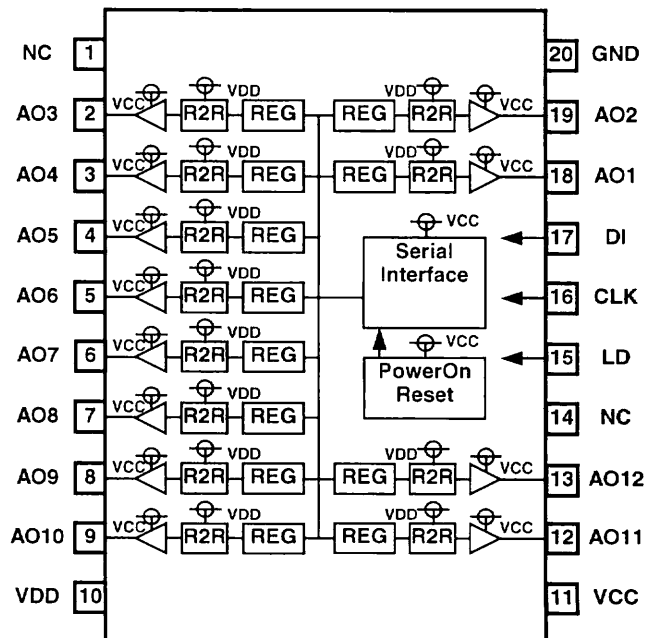
D0	D1	D2	D3	D4	D5	D6	D7	Setting
0	0	0	0	0	0	0	0	GND
1	0	0	0	0	0	0	0	(VDD-GND)/256 × 1
0	1	0	0	0	0	0	0	(VDD-GND)/256 × 2
~								~
0	1	1	1	1	1	1	1	(VDD-GND)/256 × 254
1	1	1	1	1	1	1	1	(VDD-GND)/256 × 255

•Channel setting

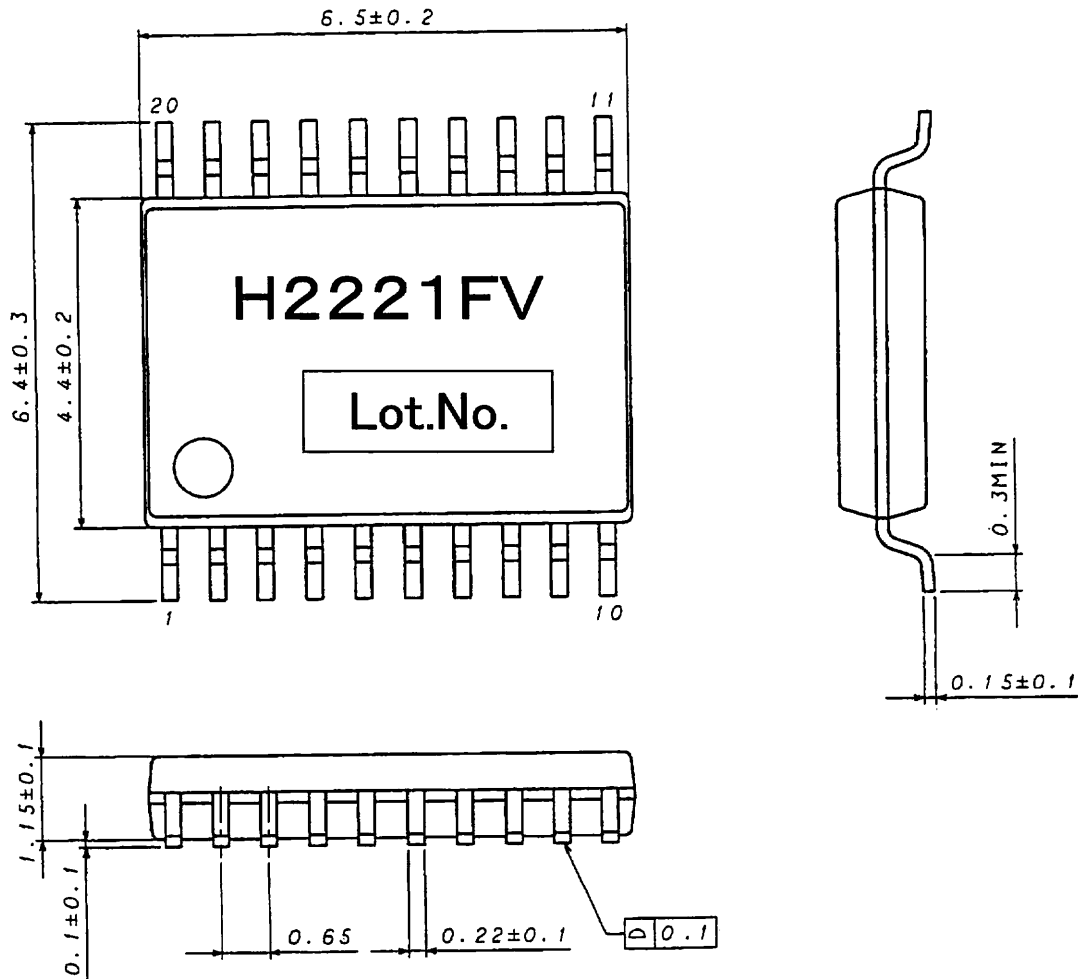
D8	D9	D10	D11	Setting
0	0	0	1	AO1
0	0	1	0	AO2
0	0	1	1	AO3
0	1	0	0	AO4
0	1	0	1	AO5
0	1	1	0	AO6
0	1	1	1	AO7
1	0	0	0	AO8
1	0	0	1	AO9
1	0	1	0	AO10
1	0	1	1	AO11
1	1	0	0	AO12
except the above				Don't Care

◇Pin description/Block diagram

No.	Name	Function
1	NC	No connected
2	AO3	Analog output terminal
3	AO4	
4	AO5	
5	AO6	
6	AO7	
7	AO8	
8	AO9	
9	AO10	
10	VDD	
11	VCC	Power source terminal
12	AO11	Analog output terminal
13	AO12	
14	NC	No connected
15	LD	Serial data Load input terminal
16	CLK	Serial Clock input terminal
17	DI	Serial Data input terminal
18	AO1	Analog output terminal
19	AO2	
20	GND	Ground terminal



◇External dimensiond(SSOPB20)



Drawing No. : EX154-5001

◇Cautions on use

- (1) Numbers and data in entries are representative design values and are not guaranteed values of the items.
- (2) Although we are confident in recommending the sample application circuits, carefully check their characteristics further when using them. When modifying externally attached component constants before use, determine them so that they have sufficient margins by taking into account variations in externally attached components and the Rohm LSI, not only for static characteristics but also including transient characteristics.
- (3) Absolute maximum ratings
If applied voltage, operating temperature range, or other absolute maximum ratings are exceeded, the LSI may be damaged. Do not apply voltages or temperatures that exceed the absolute maximum ratings. If you think of a case in which absolute maximum ratings are exceeded, enforce fuses or other physical safety measures and investigate how not to apply the conditions under which absolute maximum ratings are exceeded to the LSI.
- (4) GND potential
Make the GND pin voltage such that it is the lowest voltage even when operating below it. Actually confirm that the voltage of each pin does not become a lower voltage than the GND pin, including transient phenomena.
- (5) Thermal design
Perform thermal design in which there are adequate margins by taking into account the allowable power dissipation in actual states of use.
- (6) Shorts between pins and misinstallation
When mounting the LSI on a board, pay adequate attention to orientation and placement discrepancies of the LSI. If it is misinstalled and the power is turned on, the LSI may be damaged. It also may be damaged if it is shorted by a foreign substance coming between pins of the LSI or between a pin and a power supply or a pin and a GND.
- (7) Operation in strong magnetic fields
Adequately evaluate use in a strong magnetic field, since there is a possibility of malfunction.

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